GrummanWorld

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New Space Systems Division Launched

Space evokes pangs of nostalgia for thousands of Grummanites, but more important, it's a fast-growing market that's expected to reach $19 billion in 1986. At Grumman, space will account for $52 million in sales in 1986 – more than double that of 1985.

Space programs used to be part of Grumman Aerospace, but with the company reorganization last year, a separate division was formed to pursue this market – Space Systems. It officially went into operation on January 2, with an employee population of about 500 Grummanites.

"Nineteen-eighty-five was a good year," says Alex Alexandrovich, president of the Space Systems Division. "We won most everything we bid on. For good reason, we're excited about what we're doing, and where we're going."

In 1985, Grumman became a major preliminary-design subcontractor on three of the four Space Station work packages. "One of our strengths is that we are a *manned* space company," says Alexandrovich. "The only other company that also specializes in this area is Rockwell. However, we haven't had a major space hardware contract since the LM and OAO [Orbiting Astronomical Observatory] days. That's why we've gone full speed for the Space Station."

Grumman determined that its chances of building some part of the Station hardware in the future would be better as a subcontractor on all of the preliminary design jobs – and that strategy led to the three wins.

The space market encompasses military as well as civilian projects, and Grumman won in 1985 a $28 million preliminary design contract for the Boost Surveillance and Tracking System (BSTS), and nine space-based radar contracts. The most recent space-based radar contract calls for the testing of a Grumman-designed phased-array lens on a 1988 Space Shuttle flight.

The technology employed by the BSTS program includes a mosaic sensor and what's known as Z Technology. "We believe we have built a better mousetrap," says Alexandrovich.

Like the eye of a frog, a mosaic sensor has many elements, called pixels. Each can simultaneously look at a different section of earth. Grumman's Irvine, California, Operations has been working on mosaics for about a decade, and the Irvine-developed "Z" technology gives the mosaic sensor a third dimension. Contained within this third dimension would be microchips for information processing.

Grumman's BSTS contract is one of three – Lockheed and TRW received almost-identical amounts to do the same work.

"In the short term, our technology is being channeled toward the Strategic Defense Initiative, also known as 'Star Wars'," says Alexandrovich. "But we see surveillance as having long-term market potential independent of SDI."

For 1986, SDI has been exempted from the effects of the Gramm-Rudman budget-balancing law, recently passed by Congress. But in 1987, Gramm-Rudman could have an impact on both SDI and the Space Station.

"I think the infrared and radar work will continue reasonably on course – and that's Grumman's area of involvement. Of course, it remains to be seen how Gramm-Rudman would affect follow-on contracts," he says.

"There's some anxiety over whether the Space Station will be stretched," he continues. "As we read it, the Space Station will go on to meet the schedule set out for it at the beginning, but the content will be somewhat different.

"I don't see it as being in serious jeopardy. For one thing, America is trying to get international support for the Station. For that reason, we can't take a yo-yo approach – going full force one year and cutting back the next."

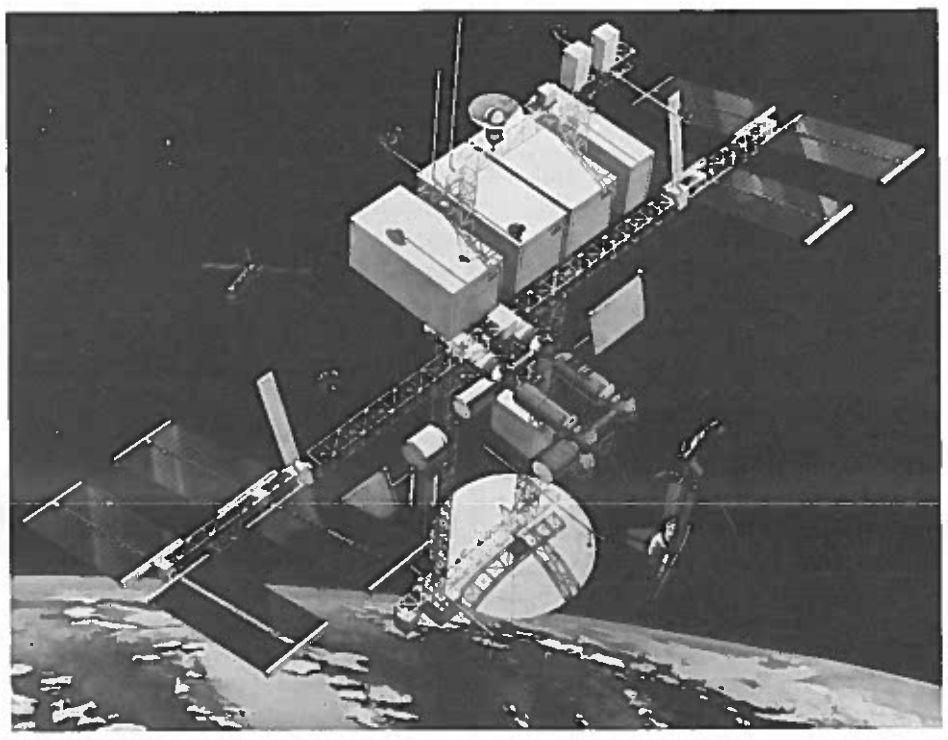
Alexandrovich also notes that SDI may be affected by future disarmament initiatives, but again, its infrared and radar research programs will continue. "I predict in two years, one of the agencies will release to competitive bid a large radar program," he says. "And Grumman's technological developments will make it a strong contender for a contract. I'm really bullish on our technology."

Space commercialization is another area in which Grumman hopes to make an impact. In 1986, a Grumman gallium arsenide experiment will fly aboard the Space Shuttle. Its mission: to determine whether better semiconductor crystals can be made in the weightlessness of space.

"It's an unknown," Alexandrovich says. "You don't know if you'll be successful, but you won't know unless you try – and if it works out, there could be a big business for materials manufactured in space."

He expects the Space Systems Division's work force to grow by about 50 people this year. A small work center will be set up in a Houston building that is across the street from Johnson Space Center. The building was originally meant to house Grummanites working on the Space Transportation System Operations Contract, which Grumman bid for and lost.

The division also plans to move its Space Station mockups from Bethpage to the high-bay manufacturing area at nearby Grumman Houston. "It's been our desire for some time to give Grumman a presence in Houston," says Alexandrovich. "This is our opportunity to do that." ■



Next Frontier. *This is an artist's rendering of the latest version of the U.S. Space Station, scheduled to go into orbit in the 1990s. Sales in Grumman's new Space Systems Division are expected to reach $52 million in 1986 – more than double their 1985 showing.*

Grumman Signs Penguin Missile Pact

Aerostructures teams with Norwegian firm to market, co-produce anti-ship missile

Grumman and A/S Kongsberg Vaapenfabrikk of Norway recently signed a business agreement to jointly market and further develop the Penguin anti-ship missile. The agreement also calls for Grumman to eventually co-produce it.

"The company will support the Norwegian firm's activities in the United States and spearhead the effort in other selected countries," says Aerostructures President Tom McGrath. "This follows agreements penned in 1982 and 1983 that brought the companies together to expand the Penguin's market."

The U.S. Navy is procuring a folding wing version of the missile for use on the anti-submarine warfare SH-60B LAMPS III helicopter. Grumman will fabricate the folding wing mechanisms and inner panel. "We have completed the design work and expect to qualify the folding wing by mid-1986," states program director Paul Butler. "We are now initiating an effort to support Kongsberg in the integration of the Penguin into the helicopter's avionics systems."

Grumman hasn't built a missile since the Rigel in the late 1940's, which never went into production. The company wanted to get back into the business, says Butler. "We wanted to tie in with a missile maker with a proven product."

Grumman and Kongsberg found that each complements the other's skills. Kongsberg had a remarkable anti-shipping missile to sell – one of a kind, says Butler. "It fits into a unique weight and warhead category, being able to sink a frigate or destroyer and yet small enough to be carried on a helicopter. The Harpoon and the Exocet are too heavy to be carried on a helicopter.

"It's also a difficult missile to decoy," says Butler. "Most analogous missiles are radar or laser guided." When their homing devices are turned on, an alert target knows the missiles are coming. "The Penguin is inertially guided with a passive infrared homing device. It's a difficult missile to destroy. . . .A true fire-and-forget missile."

Kongsberg had developed it as a surface-to-surface missile for the Royal Norwegian Navy. The Swedish, Greek, and Turkish navies also purchased it. Kongsberg wanted to sell it to other nations, particularly the United States. But the company needed some marketing help, preferably from a teammate with aircraft systems integration skill. Grumman fit the bill and the companies signed their first co-marketing agreement in late 1982.

McGrath says that Grumman will assist Kongsberg in a number of areas, in addition to making the folding wing inner panels and mechanisms. These could include the testing and integration of subassemblies and guidance systems, training, publications, and depot level maintenance.

Production work will be done at Great River Operations. The current Kongsberg/Grumman program only calls for the production of about 200 missiles through 1991, but the degree of success of the marketing effort could change that number. ■

Technical Services Forms New Aircraft Services Unit

Field and tech reps transferred from Field Ops

Over 500 Grummanites from Field Operations have transferred to the Technical Services Division. They are now part of that division's new operating unit called Aircraft Services.

"The addition of Aircraft Services broadens our business base," says Division President Fred Haise Jr. "It increases our competitiveness in servicing Grumman aircraft products and offers new growth opportunities for operations and maintenance work in other areas, such as trainers, simulators, aircraft flight line maintenance, flight lines, and logistics."

The Technical Services Division has about 750 people processing shuttles on the ground and testing payloads at the Kennedy Space Center in Florida. Another 350 are helping to start up the western spaceport at Vandenberg Air Force Base in California. A handful of people are working at the Johnson Space Center in Houston, Texas.

Its new Aircraft Services unit is comprised of two segments: Field Engineering, and Operations and Maintenance. By far, Field Engineering is the larger with approximately 400 field representatives supporting Grumman aircraft around the world. The new Operations and Maintenance group is smaller with 180 people, yet it is expected to grow substantially in 1986.

The restructuring has helped the new Aircraft Services unit streamline its operations and cut overhead costs considerably. "We are now able to bid competitively and are better positioned for growth," says George Tomlinson, director of the new Aircraft Services unit and former deputy director of Field Operations. "It also gives us greater flexibility with our resources – from contracting to marketing to pricing."

The shift of field reps to a new division does not signal the end of Grumman field service tradition, which has been going strong since the first company field rep was assigned to the Navy in 1934. Field Operations under the direction of Vice President Jack Christiansen and his new deputy Ed Yurkerwich remains in the Aircraft Systems Division.

As in the past, Field Operations will provide company presence at customer sites around the world. Its managers continue to be the communication link between the customer and Grumman's aircraft program management and technical communities.

Grumman's restructuring in 1985 came at an opportune time for Field Operations. "For the past four years, Field Operations has been studying ways to branch out and take on more work in the technical service field," says Tomlinson.

The shift of reps and technicians to the Technical Services Division affords Grumman a lean organization to competitively bid for service and maintenance contracts for the military. At present, these contracts deal mostly with maintenance of simulators and trainers.

"Only recently has this type of maintenance work been offered to the private sector," says Tomlinson. "In 1983, the Navy decided to phase out supplying its own personnel in this area and assign those people to tactical areas. The maintenance work was put up for outside bids. The Army and Air Force are following suit."

Competition for these maintenance contracts is keen. Grumman found out the hard way when it lost the Navy's first maintenance contract for the F-14 trainers. "That's when we got our education," says Tomlinson. "After all, the trainers support our airplane." However, the contract proved more difficult than expected. The winning contractor couldn't do the job, so Grumman had a second chance to win – and did.

The restructuring already began paying off in the latter part of last year when Technical Services received several maintenance contracts for the U.S. Navy. "Today, we not only service Grumman products. We are starting to win jobs to maintain other company simulators and trainers. And, we are preparing to bid on aircraft maintenance and logistics contracts."

In the past, Grumman would manage these contracts while using people hired by a job shopping firm. "Starting in March, we will begin hiring those jobshoppers for full-time positions in Operations and Maintenance," says Tomlinson.

By the end of 1986, Aircraft Services is expected to grow to over 700 people.

Both Field Operations and the new Aircraft Services unit will be working side-by-side in the field and at the home base. In fact, both organizations will be moving their operations to the brick building just north of Headquarters in the near future. Tomlinson and Christiansen will still be only an office away from each other. ■

Aircraft Services Appoints Directors

The establishment of Aircraft Services as an operating unit of the Technical Services Division resulted in the following appointments.

George Tomlinson has been named director of Aircraft Services, reporting directly to Division President Fred Haise.

In addition, Bill MacFarlane has been appointed director of Field Engineering; Mike Lenzo, director of Operations and Maintenance; Don Cleary Jr., controller; and Ed Sachs, director of Business/Administration Operations.

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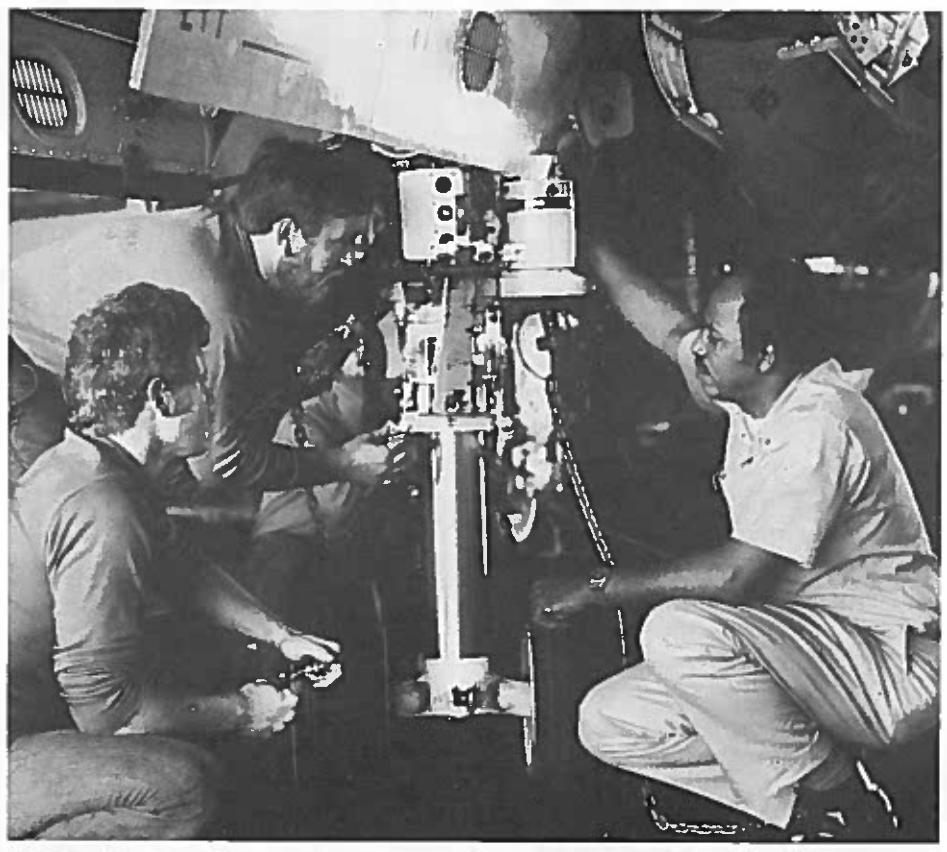


With The Fleet. *Grummanite Adrian Cadoria (R), an F-14 airframes representative, is one of several hundred people who transferred from Field Operations to the new Technical Services Division unit called Aircraft Services. Cadoria frequently assists Navy personnel aboard carriers. His specialty is the F-14 airframe.*

Grumman Boats Shine At Big Apple Show

The popularity of Grumman Boats' new line at the recent New York Boat Show foretells clear sailing for this Grumman Allied unit. Meanwhile, at an exhibit in Little Rock, Arkansas, the unveiling of a new pontoon line rocked a few competitors.

"We are up 40 percent in sales, while the industry is up 11 percent," says Bob Steinway, the general manager of Grumman Boats.

Surrounded by boats costing as much as a house on Long Island, the Grumman exhibit on the second floor of the New York Coliseum was a safe harbor for those who didn't win the lottery. The exhibit featured three canoes, a flat bottom jon boat and three of Grumman's popular new Fisherman line.

Grumman Boats brought two dealers to the show. DeFeo Boats of New Jersey just added the Grumman line last year. "We took on the Grumman line because of its quality," said Rick DeFeo, who was also selling Regal powerboats at the show.

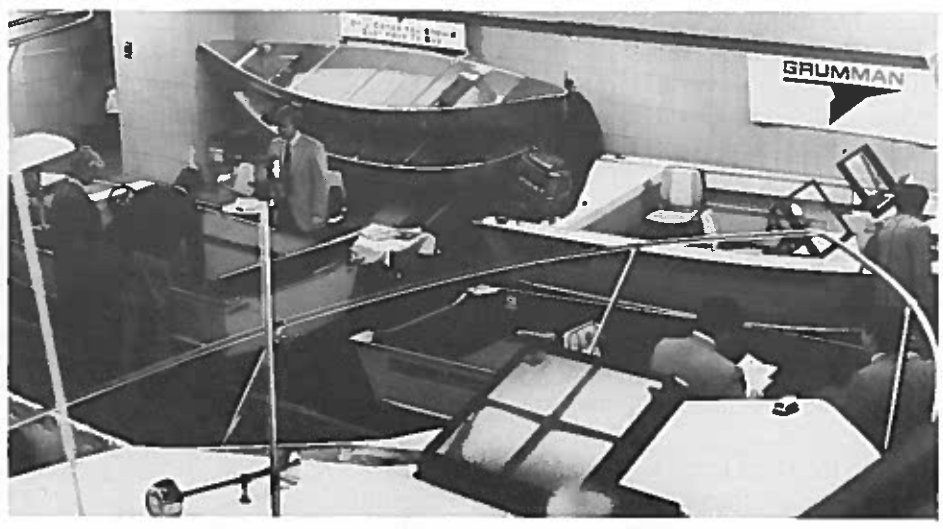
DeFeo reported that sales have been good. He sold 24 boats during the New York show. Final figures aren't in from Buster's of Broadchannel, New York. But Steinway says their preliminary report shows sales of 20 boats the first weekend. "If that trend held up throughout the show, the results should be very good," says Steinway.

Steinway thinks the upcoming season will be good. "Sales are going well for a number of reasons. We've added some new dealers. We now have a full range of models. Our new split-seat Fisherman series has been very well accepted and people like our new colors."

Competitors are wary of Grumman's newest product. In the wake of the New York show, Grumman Boats announced a new line of pontoon boats, which have platforms supported by two air-filled cylinders. Called party or fun boats, the pontoon boats come with canopies and furniture.

"We showed a prototype in Little Rock two weeks ago. We sold two of them, which is surprising because prototypes are a little rough," says Steinway.

Although Grumman unveiled only one boat in Arkansas, it later broke the news that it would be selling 20-, 24- and 28-foot pontoon models. "At the Arkansas show, most of the competitors said, 'You guys are going to be rough to beat with this boat.'" ■



Big Apple Boat Show. *Grumman Boats showed its line of canoes and aluminium boats at the recent N.Y. Boat Show held at the New York Coliseum in New York City.*

Mohawk Heads West For Flight Tests

Army to test re-engined Mohawk at Edwards Air Force Base

Next month, a re-engined Grumman OV-1D Mohawk will leave humid Florida for the dry desert air of California.

At Edwards Air Force Base, the Army will conduct 25 to 40 hours of flight testing. This is the final leg of a project to develop and test a more powerful engine for the Army's OV-1D and RV-1D aircraft.

"The engine testing program has been under way since September," says Jim Flowers, Mohawk assistant program manager for Grumman. "The Army vice chief of staff wants us to detemine the feasibility of increasing the OV-1D's and the RV-1D's engine performance."

The OV-1D is the Army's battlefield surveillance plane. It was used by the Army in Vietnam, and more recently, by the Oregon Air National Guard to monitor Mount St. Helens. The RV-1D has an airframe identical to the OV-1D Mohawk, but different electronics; it serves an electronic intelligence-gathering role.

Both aircraft have increased their electronics content – and thus their weight – since the early Sixties, when the airframe was designed. "As a result, the Mohawk's current Lycoming turboprop engines, though adequate, have been pressed to the limits of their ability," says Flowers. "The current engines leave no margin for increasing the weight of the aircraft in the future."

Each of the Mohawk's current Lycoming turboprop engines is rated at 1,400 horsepower. The Army wants to boost that to 1,800 horsepower.

The new engines are also manufactured by Lycoming, and – other than the higher output – are basically the same. Approximately 10 internal parts have been redesigned, and a new fuel control has been added, enabling the engine to achieve greater temperatures and greater power.

Pending the outcome of the flight tests, new engines could become part of a Mohawk block improvement program, for which negotiations are now under way with the Army. The block improvement program could last six to seven years, beginning work this year, and would involve 59 Mohawks.

Among the improvements already being negotiated: new avionics; new video displays and controls in the cockpit; and a service-life extension from 7,000 to 12,000 hours.

The re-engined Mohawk first took to the skies earlier this month at Aircraft Systems' Stuart, Florida, facility, which is where the Mohawk program is based. Sometime during February, Grumman will deliver the Mohawk to the Army.

At Edwards, the Mohawk will be flown by an Army pilot and Grumman pilot Chris Wold.

Along with a new engine, two hydraulic actuators have been installed in the plane's rudder control system. This reduces the amount of effort the pilot must exert to control the rudders. ■

East To West. *Plane captain Ray Harris checks instrumentation on the OV-1D Mohawk. The Mohawk will leave its Stuart, Florida home next month for flight testing at Edwards Air Force Base, California, of new, more powerful engines.*

Houston Takes Over a Hot Job

Electronics Systems transfers curing oven from Great River to Houston for computer bench work

At the end of last year, a five-ton curing oven made a five-day, 1,800 mile trek from Electronics Systems' Great River Operations on Long Island to the division's Houston facility in Texas.

At Houston, the 12x12x11 foot oven will be used to produce bonded benches for the electronic support equipment found aboard aircraft carriers. A bonded bench houses the electronics.

Parts for these benches are not joined by rivets, but bonded with special cement. They are then cured in the oven at 800° Fahrenheit. This is not a new job for Grumman – the company came up with the concept about a decade ago. Since then, Great River Operations has made both the bonded bench and the electronics that go inside.

Great River will continue to manufacture and install the electronics. Moving the structural part of the job to Houston will free up vital floor space and enable Great River to focus exclusively on electronic assembly. The new job will also help stabilize the work force at Houston.

This electronic support equipment is housed in box-like vans aboard the carriers, and helps keep Navy aircraft and their electronic components flight ready.

Each of the Navy's 14 carriers has a flight deck longer than a football field and a huge hangar below that. The vans are suspended from the hangar's ceiling and are accessed via a spiderweb of stairways and catwalks. Inside each van are computers and test equipment specially designed for a particular plane.

Great River will continue to deliver some of the completed systems directly to the Navy. Meanwhile, other units will be sent back to Houston for installation in the vans. The van is government-furnished-equipment and usually measures 20 feet long by eight feet wide by eight feet in height. Grumman Houston will install floors and electrical wiring.

"Grumman Houston is the right location for making the structural assemblies that house electronic devices," says Rudy Avitabile, deputy general manager at Great River Operations. He also notes that the job takes up a large amount of floor space, and Great River had been experiencing a space crunch due to increased electronics work.

The project bears some similarity to the trailer-like computer shelters Grumman Houston now builds for Sperry Corporation, and the blue-painted offshore units built earlier for Schlumberger. The offshore units house geological test equipment and are aboard offshore oil rigs. Great River made the electronics for that program, also.

The Grummanites in Houston who will handle the job initially will switch from the offshore unit program, according to Jim Reinhartsen, director of Operations there. "It's a natural evolution from one project to another," says Reinhartsen. "We already had the people and the skills – they just had to be moved from commercial to military hardware. No massive training effort and no increase in the work force was required." ■

Future Mfg. Engineers Invited To Compete For Scholarships

Competition is now underway for the 1986 Grumman Manufacturing/ Engineering Technology Scholarships.

If you have an associate's degree in manufacturing engineering or technology or have two years of engineering school under your belt, you can apply for this two-year scholarship. Deadline is March 15.

The program is open to all Grummanites, as well as any Long Island students who meet the requirements. Scholarship winners receive annual awards that they apply towards tuition, fees and expenses for their four-year degrees. Last year, the award was $4,500. These scholarships can be used in any accredited program in the country.

When scholarship winners graduate, they return to manufacturing engineering jobs within Grumman. A dozen winners are now using their degrees at Grumman, while another 13 are working toward their degrees.

For more information, contact Fred Neuscheler, Ext. (111) 58268, Mail Stop B18-02. ■

Obituaries

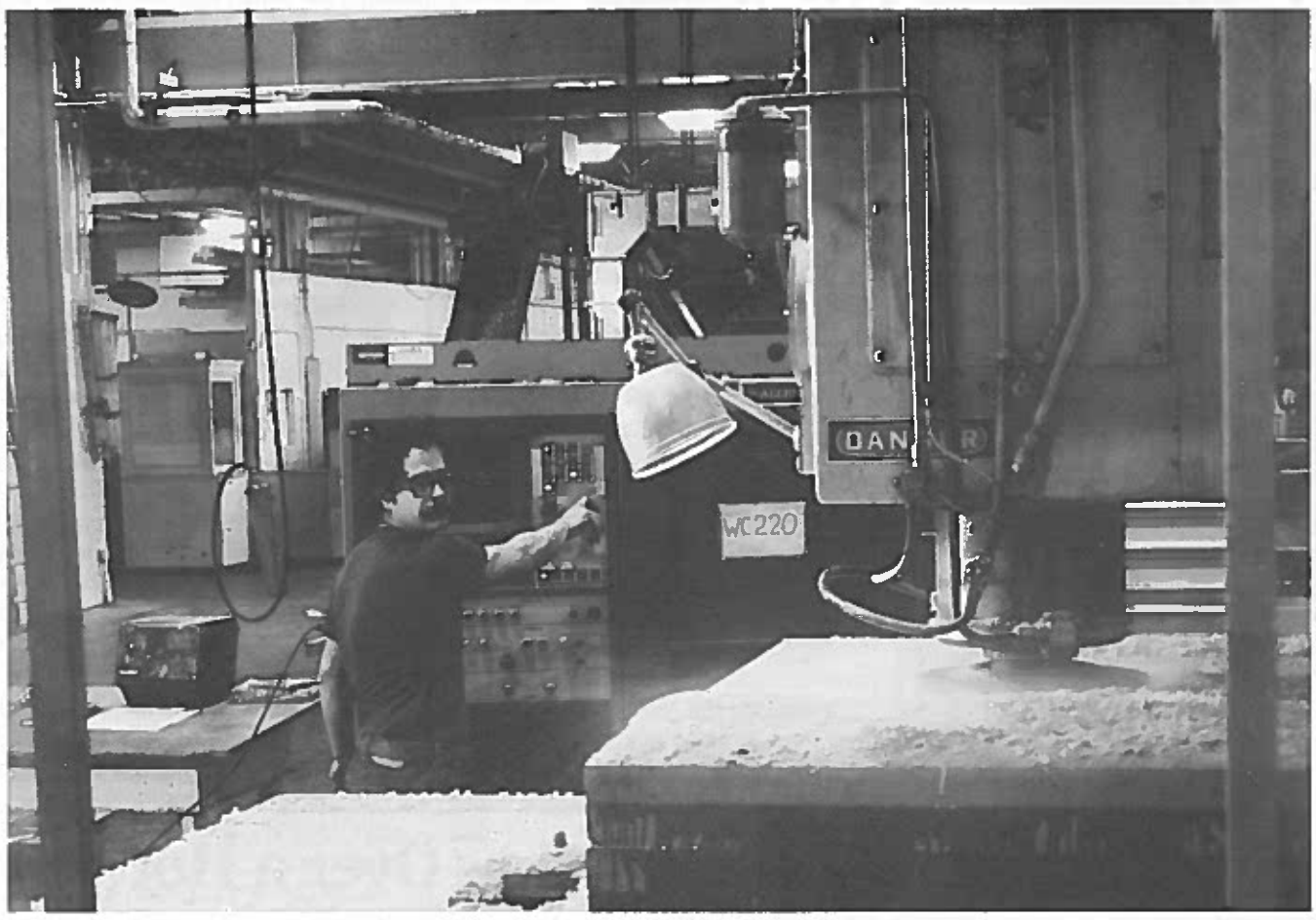
Salvatore Borrelli, Transportation, Calverton, Aircraft Systems Division, died Jan. 7 at the age of 68. He had been with the company since 1963 and resided at 21 Wauwepex Trail, Ridge, N.Y.

Daniel Burford, Legal, Bethpage, Services Division, died Dec. 17 at the age of 63. He had been with the company since 1962 and resided at 811 Linden Ave., Baldwin, N.Y.

Alfred E. Gordon, Corporate Contracts, Melville, Aircraft Systems Division, died Dec. 26 at the age of 60. He had been with the company since 1964 and resided at 28 Primrose La., Levittown, N.Y.

Leon S. Meinstein, Business Systems Development, Bethpage, Data Systems Division, died Dec. 20 at the age of 54. He had been with the company since 1972 and resided at 21 Caravan Dr., E. Northport, N.Y.

Gerald Weckerle, Inventory Management, Great River, Electronics Systems Division, died Dec. 11 at the age of 55. He had been with the company since 1956 and resided at 701 Myrtle Ave., West Islip, N.Y.



A Chip Off The Old Block

Machinist Tony Truocchio keeps a close eye on the computerized control console, as he fly-cuts a block of Richlite wood/epoxy boards on a computer-numerical-control, four-axis Cincinnati milling machine.

Fly-cutting involves the use of a round, disc-shaped drill bit that showers a lacy veil of sawdust as it smooths the surface of the block. After initial smoothing, the block will have computer-designed contours machined onto its surface. The block is then used as a die cast to make such parts as fuselage skins and engine door covers for the Gulfstream IV.

Aerostructures Ships 100th Set Of Spoilers

Grumman's Aerostructures division recently delivered its 100th shipset of wing spoilers to The Boeing Commercial Airplane Company. The spoilers are for Boeing's 757 commercial transport airplane.

Spoilers are wing control surfaces which are mounted on the upper surface of the wing. Grumman builds the composite graphite spoilers at its advanced composites facility in Milledgeville, Georgia.

The milestone 100th shipset was delivered directly from Milledgeville to Boeing's 757 manufacturing facility in Renton, Washington on Tuesday, January 14.

"Since the first shipment of spoilers in May 1981, Grumman has delivered each and every shipset to Boeing on schedule," says Bill Brown, Aerostructures' Boeing 757 Program manager.

Brown says Boeing's original spoiler design underwent two changes suggested by Grumman that have reduced the overall weight of each shipset from a projected 365 to an actual 274 pounds. The changes were incorporated without any interruption to the manufacturing schedule.

Under the current contract, Grumman will manufacture 200 shipsets of spoilers for Boeing with an option for 200 more. A shipset contains 12 spoilers that average 22x70 inches in size and weigh approximately 22 pounds each.

"We're currently delivering three shipsets per month," says Brown. "But that rate will climb to four per month in March and then increase to five in October. That will be out highest rate of spoiler production to date."

According to Brown, with spares and test articles, Grumman has delived a total of about 1,300 spoilers under the current contract. "There is also considerable potential for spoiler work into the 1990s," he says.

Boeing recently signed a contract to sell United Parcel Service 20 of the freighter model 757 aircraft with an option for 15 more. "Boeing expects to produce about 1,200 757s during the life of all models," says Brown. "We hope to be aboard supplying spoilers for the duration."

Aerostructures work on another Boeing contract – making 767 midsections – is also due to pick up soon. Grumman is currently delivering two wing-fuselage center sections per month to Boeing and will increase that rate to three per month this August. Work is being performed on this Boeing subcontract at Aircraft Systems' Stuart Operations in Florida.

"The delivery rate increase was built into the contract," says 767 program manager Tony D'Amico. "But it wasn't until Boeing made some recent sales of its 767 that we were assured the increase would be implemented."

The Japanese airline, All Nippon, recently ordered 15 Boeing 767 commercial aircraft with an option for 10 more. The sale represents the largest single order for the 767 that Boeing has received since 1979.

Grumman's current contract runs through 1987 and calls for the manufacture of 200 shipsets with an option for 100 more. "Boeing has already given the go ahead to start preliminary planning on the option shipsets," says D'Amico.

"They are also working on a number of derivatives of the current 767, including several longer range models," he says. "I believe our performance on this contract has positioned us for future Boeing work." ■

Spoilermakers. *Layup mechanic Fay Little works on a spoiler for the Boeing 757 aircraft at Millegeville Operations in Georgia.*

Need A Match?

Have you made a contribution to your favorite college or university? Grumman has a matching gifts program that will make an equal contribution – up to $1,000.

The program is open to all Grummanites. Just send the receipt you received from the school to Carol Nelson, A12-GHQ. It is preferred that the company's gift be made in the same year as yours, but there is a grace period. If you made a contribution in 1985, submit your receipt before March 31.

For additional information, call Ext. (111) 62532.

Greyhound Delivers In Italy

The new year has just begun and already the new Grumman C-2A Greyhound has gained a reputation as a workhorse for the U.S. Navy at its new home base in Sigonella, Italy.

Five Greyhounds were delivered to the VR-24 Lifting Eagles squadron in the fourth quarter of 1985. In their first two-and-a-half months of operation, the new C-2As carried 435 passengers, 67,809 pounds of mail and 65,598 pounds of cargo to carriers stationed in the Mediterranean Sea.

"It is significant that these aircraft went right into operation with the fleet so quickly after delivery," says Harvey Fromer, C-2A program vice president. "There was no need for any big introductory period. The Greyhound is just what the Navy wanted and it's already proving itself as a premier carrier-on-board delivery system."

Grumman is manufacturing 39 C-2As through 1989 under the Navy's first ever multi-year aircraft contract. The reprocured Greyhounds will replace 19 earlier C-2As built for the Navy by Grumman from 1965 to 1968.

Five new Greyhounds will be delivered to the Navy wing stationed at Cubi Point in the Philippines during 1986. Eventually, eight C-2As will be stationed at both Sigonella and Cubi Point.

Retirees

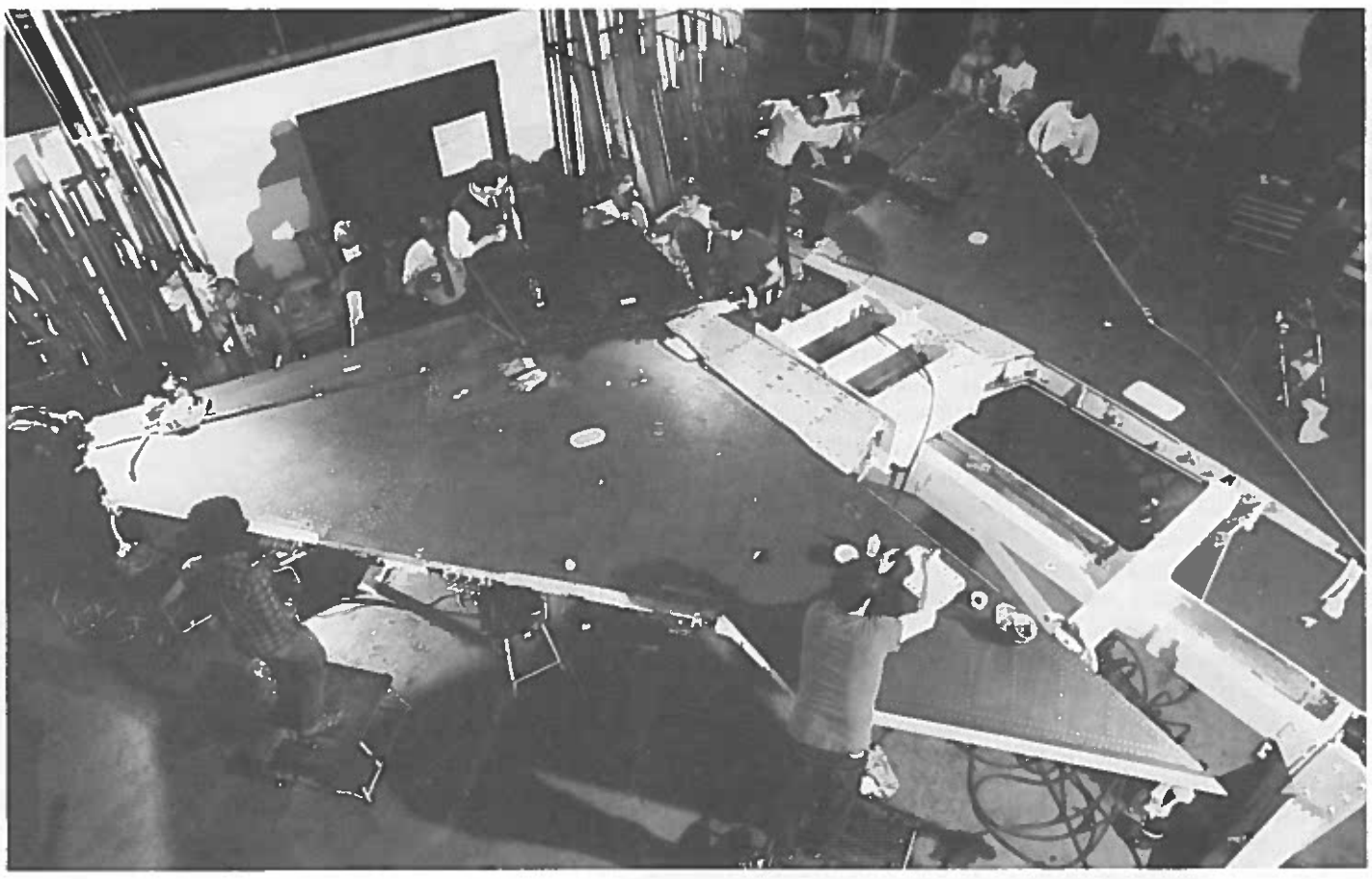
On behalf of our fellow workers, *Grumman World* salutes the following Grummanites for their contributions to the company and wishes them well in their retirement. Those who have recently retired are:

Vita L. Giacona (GHQ), Jack B. Egozcue (GHQ), Helena I. Philbin (30), Frederick J. Taylor (7), Anthony J. Bagliore (4), Norman E. Wright (3), Edward B. Morrison (20), Emanuel Salerno (77), Catherine G. Danza (77), John H. Otterstedt (56).

Personals

We wish to thank all of our friends at Grumman and ESO for their thoughtfulness and sympathy during the recent loss of my mother. **Donald Nuttall and Family**

My family and I wish to express thanks and appreciation to our co-workers, friends and ESO for their expressions of sympathy during our recent bereavement. **Gary & Sheila Bigel**



The Final Touch. *Earlier this month, Grummanites completed work on the first prototype set of wings for the new Lavi fighter in Bethpage. The wings were shipped to Israel Aircraft Industries on January 10.*

A Young Lion Gets Its Wings

Grumman delivers first shipset to Israel Aircraft Industries for new fighter

This month, the Aerostructures Division completed delivery of its first shipset of wings and vertical tail assemblies for the Israeli Lavi fighter. The completed tail section was delivered to Israel Aircraft Industries (IAI) on December 20, and the wing on January 10.

The Lavi – which means "young lion" in Hebrew – is the first all-Israeli-designed fighter. Grumman is manufacturing the graphite composite wing and vertical tail for the aircraft under a $170-million development contract awarded in June 1983.

"The Lavi is a single-engine attack aircraft that has been designed by the Israelis to replace their current fleet of Kfir and A-4 aircraft," says Aerostructures President Tom McGrath.

IAI plans to build a total of 300 production Lavi aircraft for the Israeli Air Force. According to Bob Carri, Composite Wing and Tail Program director, the program is IAI's "largest undertaking ever."

The program is also Grumman's first contract to manufacture a fuel-carrying composite wing. "The only other composite fuel carrying wings are McDonnell Douglas' F-18 and the AV-8B Harrier," Carri says. "While the wings on Grumman's X-29 are largely composite construction, they're what we call 'dry' – no fuel is carried inside the wings."

The Lavi tail section is constructed of virtually all composite material. The wing is made of a significantly higher percentage of composites than found in conventional aircraft wings.

Six Lavi prototype aircraft will be built. The first four will be two-seaters to be used as advanced trainers but with full operational capability. "The two-seater model will actually be able to do more operationally," says Carri, "because the back seat could be occupied by a weapon systems operator/navigator in place of a student pilot."

When the Lavi moves into production, one of every five aircraft will be built with twin-seats.

Under the development contract, Grumman will produce six prototype tail sections in addition to static and fatigue test articles – a total of eight vertical stabilizers.

"However, the wings are another story," says Carri. "We'll be delivering two identical shipsets of the original wing design; then, we'll switch to a different design entirely for the remaining units."

Carri explains that IAI decided to make major design changes to the original wing – altering 90 percent of the structure – to achieve increased flight performance characteristics.

Grumman will manufacture six shipsets of the new wing design plus one additional full shipset for IAI's fatigue testing and another one-and-a-half shipsets for static and fatigue tests. "Counting the first two," Carri notes, "that's a total of 10.5 wing shipsets."

The first two shipsets will be mounted on IAI's first two prototype Lavis. The wings will remain on the aircraft through flight testing of the prototypes until the first of the new-design wings are delivered in July 1987.

Carri says graphite composite construction for the wing and tail were chosen primarily to permit "aero-elastic tailoring." The composite wing surfaces resist twisting during flight offering improved control for the aircraft.

Like the X-29, the Lavi will have wing-surface-mounted control surfaces and a canard tied directly to a fly-by-wire computer system. The use of composites also offers increased durability and reduced weight compared to conventional aircraft metals.

According to Carri, representatives from IAI have been working closely with Grumman engineers, manufacturing and technical people on Long Island and in Milledgeville since the start of the program.

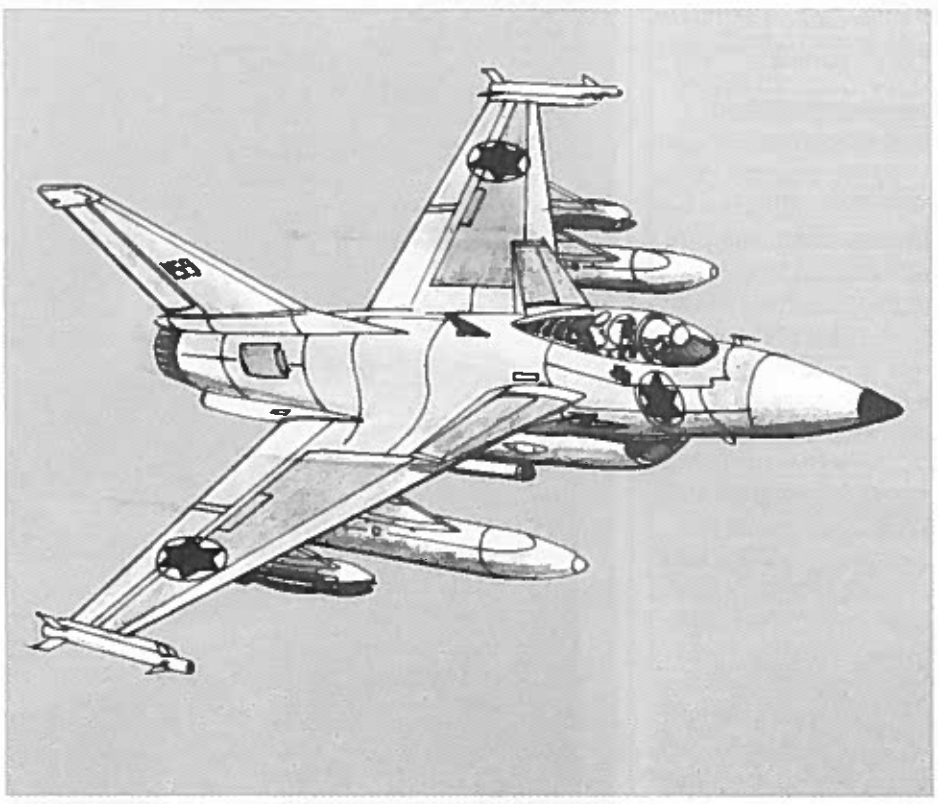
About 400 Grummanites are involved in the Lavi program, at a number of Grumman facilities on and off Long Island. All composite parts are made at Aircraft Systems' Milledgeville, Georgia, advanced composites manufacturing center. Metal parts machining is done in Glen Arm, Maryland; wiring for the wings is fabricated in Great River on Long Island; and complete sections are assembled and shipped from Bethpage.

The development contract for the Lavi wing is scheduled to end sometime in 1988. IAI plans to deliver the first production Lavi to the Israeli Air Force in early 1990. Part of Grumman's initial agreement with IAI includes a limited production contract for a minimum of 20 shipsets of Lavi wings and vertical tails.

"We're currently guaranteed a minimum of 20 production units," says McGrath. "But we'd certainly like to be making the wings and tails for all 300 of the aircraft. That would mean a multi-million dollar contract taking us well into the 1990s."

McGrath says Grumman was tapped for the LAVI job because of its knowledge and reputation as an industry leader in the use of graphite composite materials.

"Because of the ambitious performance requirements designed for the aircraft, it's been a very challenging program from day one," he says. "It's also been a very good learning experience and a chance to boost our reputation in the industry." ■



A Young Lion. *This is an artist's rendering of the first all-Israeli-designed fighter. The Lavi fighter is a single-engine attack plane that has been designed by the Israelis to replace their current fleet of Kfir and A-4 aircraft.*

Grummanites Donate Close To $1 Million To United Way

The results of Grumman's 1985 United Way Drive are in. Grummanites contributed over $923,000 during the two-week-long drive, held last October. The company-wide campaign achieved close to 92 percent employee participation, topping 1984's figure of 89.9 percent.

With the addition of a corporate gift of approximately $275,000, the total Grumman contribution for 1985 reached over $1.17 million.

"The 1985 Grumman United Way Campaign was a big success," says Dan Huebner, senior vice president-Corporate Marketing and Development, and corporate chairman for the 1985 campaign. "I wish to thank all the people who were responsible for the well-run campaign – especially all those Grummanites who reached out a helping hand and contributed to this worthwhile organization."

Not Enough To Go Around: Engineers Are In Tight Su

One of the major topics of conversation in Norm Lewin's office these days is finding enough engineering talent to fill Grumman's program needs. Considering the shortage of engineers besetting the aerospace industry today, the search is not an easy one.

"You've heard real estate people talk about a buyers' market or a sellers' market – it's the old supply and demand thing," says Lewin, director of Engineering for the Aircraft Systems Division. "Right now, it's an engineers' market."

Grumman is searching for more engineers to handle such new programs as the F-14D, A6-F and Joint STARS (Joint Surveillance Target Attack Radar System). "I spend at least twice as much time reviewing resumes and overseeing recruitment drives than I did just a few years ago," says Lewin. "I expect to be spending even more time on the search as our new programs continue to come on stream."

The shortage of engineers is not a problem exclusive to Grumman. The engineering talent crunch is being felt throughout the U.S. aerospace industry.

"What we are seeing now can be traced directly to the cutbacks experienced in the industry's work load in the early Seventies," says Tony Armstrong, chairman of the American Institute of Aeronautics and Astronautics' (AIAA) Career Enhancement Committee.

Armstrong cites a number of major factors behind the shortage: the cyclical nature of defense industry contracts; a lack of engineering students during the early and mid-70s; and stiff competition from other industries, most notably the computer firms.

"A combination of deep NASA cutbacks and the end of the war in Vietnam greatly reduced the need for more engineers in the defense industry," says Armstrong, physics manager for System Applications at Boeing Aerospace in Seattle, Washington. "In addition, the war turned public opinion strongly against any defense buildup."

These two facts combined to discourage many young people from pursuing a career in engineering at that time. They would have been the

> 'Today, those same schools that dropped or cut back on their engineering programs in the early '70s are scrambling to meet a renewed demand.'

experienced engineers of today.

According to Lewin, that lack of interest led to significant understaffing and underfunding for engineering programs at colleges across the country. "Today, those same schools that dropped or cut back on their engineering programs in the early 70s are scrambling to meet a renewed demand for the curriculum. They need the resources – equipment and qualified teachers – to train students in increasingly complex fields," he says.

Another problem is an underutilization of the engineering talent already in place. "Many of our more experienced engineers are in supervisory positions, overseeing large programs," says Lewin. "Their jobs keep them extremely busy, leaving not nearly enough time to train the less experienced engineers as thoroughly as we would like."

The hiring problem is further aggravated by increased competition for skilled engineers. Competition comes from the fast growing computer industry as well as from automobile manufacturers, civil engineering firms, and even colleges seeking to fill professorships.

Such competition has created an expensive situation for employers. "We see some of the same engineers at every job fair and open house," says Lewin. "They're just out there shopping the market."

It is not uncommon today for engineers to move from one company to another – working for as many as three or more firms within as little as five years.

"For instance, in California – especially in the so-called silicon valley – computer and aerospace companies are vying for the same people," says Lewin. "Engineers sometimes move aound so much – escalating their salaries with each move – that they eventually price themselves out of any other market but California.

"However, jumping around that much may be a questionable career strategy," he says. "Eventually, the resume with a half dozen job changes on it could be unattractive to prospective employers."

Regardless of the shortage, Lewin says the industry's primary concern is still costs. "Our customers – notably the DoD – are extremely concerned with costs," he says. "That's why we have to be conscious of our own expenses and remaining competitive in the marketplace.

Considering the high cost of recruiting, transferring and training new engineers – most companies are concentrating their recruitment efforts primarily in their own backyards.

"It's easier to find and keep someone who already lives in the area," says John Robb, Grumman manager of Personnel Liasion. Robb is also chairman of the Regional Industrial Technical Education Committee, part of the Long Island Forum For

> 'It's easier to find and keep someone who already lives in the area.'

Technology.

"In the committee's studies, we've found that it's not just money that today's engineers are looking for – everyone offers competitive salaries," says Robb. "They're also looking for a certain lifestyle."

Robb says selling Grumman is easy. "We have a good reputation in the engineering community." But selling Long Island can be a lot tougher. "Especially when you're talking to someone from sunny Florida or the West Coast who thinks Long Island is just a cement-paved, highway extension of New York City."

Robb says that a combination of factors peculiar to Long Island makes it doubly difficult to woo engineers here. Long Island is one of three areas – California and Boston being the others – with the highest housing costs in the country.

Help Wanted. *Grumman has been running full page ads (above), attending career fairs around the country and holding open house interviews to attract much needed engineers to Grumman's ranks. At right, college recruitment representative Andy Kupec (seated) reviews an applicant's resume at a recent open house in the corporate headquarters building in Bethpage.*

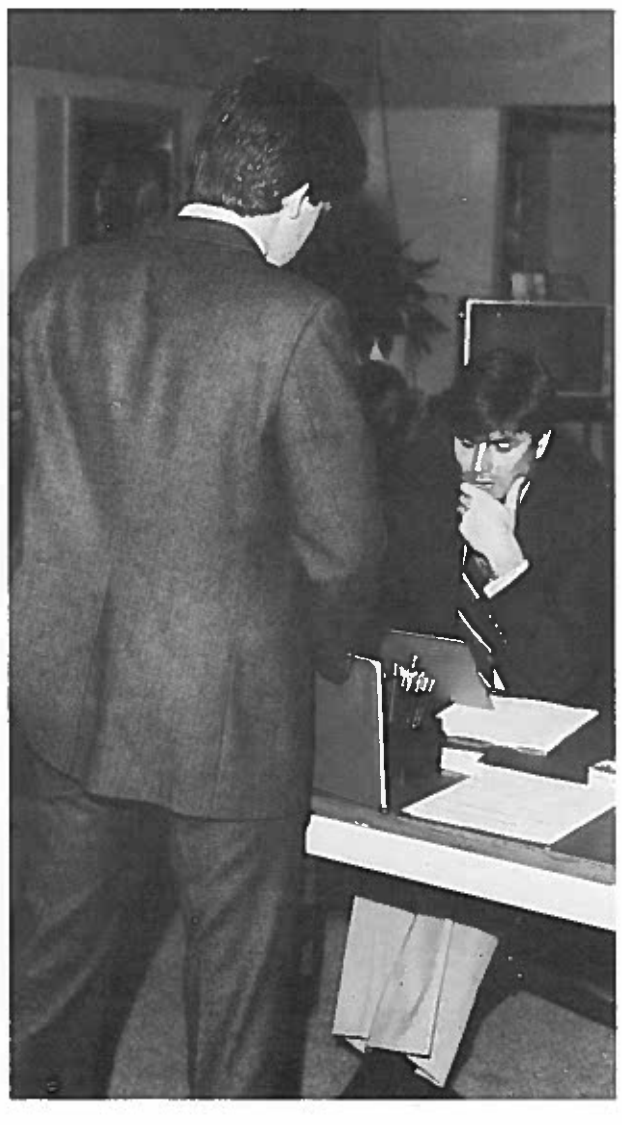
Filling A Need. *Mechanical engineer Vin Thomas is surrounded of Building 5 in Bethpage.*

Figures indicate Long Island housing prices are approximately 20 to 25 percent above the national average and as much as 50 percent more than such other high tech areas as Atlanta and Phoenix. "Add to that, a state income tax, high local real estate taxes, energy and transportation costs, and you've got a package guaranteed to scare people away," says Robb.

"The truth is though – once we get someone to come here and see what Long Island is really like, more often than not they want to stay," he adds.

Over the past three years, Grumman has been recruiting very aggressively, says Robb. "The company has been spending a lot of money and energy advertising, attending job fairs, visiting colleges and high schools and generally looking for engineering talent in every corner and under every rock."

In that time, there has been a net growth in the company's engineering ranks of approximately 1,700 people to a current staff of approximately 3,500. That figure takes into account retirements and other attrition. To accomplish this, the company hired close to 2,500 engineers from 1982-85 – including about 1,000 new college graduates.



pply

mpty desks and drafting tables on the Engineering floor

"There are plenty of new grads to go around," says Lewin. "And we've more than met our new-grad hiring goals in the last few years with some really outstanding young people."

The number of new college graduates that Grumman hires each year to fill engineering needs has increased dramatically since the beginning of the decade. In 1980 and '81, Engineering hired slightly more than 100 new grads. That figure doubled to over 200 in 1982 and has risen to an average of over 250 hired in each year since 1983.

"We need the new engineering graduates to help do the high-tech work of today and to train as tomorrow's supervisors," says Lewin. "But there is a *limit* to the number of new-grads we can absorb and still keep a balanced experience level within our engineering ranks. The really urgent need today is for more experienced people."

While Grumman and the industry are searching for experienced engineers in virtually every discipline, the most pressing needs are for systems avionics and software engineers. Grumman's needs in these areas increased considerably with the winning of the Joint STARS contract.

"Joint STARS is a highly complex systems integration program," says Lewin. "And it involves precisely the kind of engineering disciplines in which experienced people are in shortest supply."

Even though the program will eventually be located in Florida, Lewin says, "It's still going to take a lot of work to attract enough of the right people." In order to fill its Joint STARS needs, Grumman recruiters have been running job fairs and attending career days all over the country.

The company has also taken some steps to ease the overall shortage problem in specific engineering discipline areas with in-house training programs. "We've had some good success with developing system and stress engineers through these programs," says Lewin. "But it's still a long way from solving the problem." Currently there are less than 25 people involved in these training programs.

A more unusual source of aid has recently come from "across the pond" – in the form of 28 British engineers loaned to Grumman by the British Aerospace Company. Lewin says British Aerospace was having a "cyclical drop" in its engineering requirements that fortunately coincided with Grumman's increasing engineering needs.

On loan for six months, the British engineers are primarily structural people – stress analysts and structural designers. The group is stationed in Melville, L.I., where they are working on a variety of Grumman programs.

"They've helped out a great deal," says Lewin. "Most of them were already trained in computer graphics and some are experienced with composites – just what we needed. They even came with their own supervisors to interface with our program managers."

Lewin points out, however, that the British engineers are only on loan – a temporary solution to a long term problem. "Loaned engineers and in-house training programs have helped ease the immediate effects of the engineer shortage somewhat," says Lewin. "But these are not real solutions to the basic problem."

One idea being considered as an answer to the long-term problem of the engineer shortage is the establishment of "satellite" engineering offices. The offices would be located at a number of sites around the U.S. where sizable engineering talent pools already exist.

"It's the old idea of going to the mountain," says Lewin. "If we can't get enough people to come to us, then we'll bring the work to them."

The satellite concept would involve specific self-contained engineering work packages that could be accomplished away from Grumman's main facilities. Several experienced engineers from the company would be assigned to take the project to an area that has a sufficient pool of the specific engineering skills necessary. An office would be established and engineers hired to work on the project in their own local environment.

> 'If we can't get enough people to come to us, then we'll bring the work to them.'

Lewin says a pilot satellite project may be established in the Houston area soon – "to see if the idea can be implemented effectively and meshed with overall program schedules efficiently."

The satellite idea is just one of many being considered by Grumman. "We have a very serious problem on our hands, and it has a direct effect on Grumman's current and future business," says Lewin. "It's going to take some very serious thought and actions to rectify the situation.

"In the meantime, we'll continue hiring and training new graduates and beating the bushes to find the necessary skilled people to keep our programs growing." ■

Recruiters Beating The Bushes For Engineering Talent

Finding and holding on to new engineers isn't easy these days. It can also be very expensive. An employment agency's fee for finding just one new engineer can run to $10,000 or more.

Because of this expense, Grumman has been turning more and more to recruiting trips, job interview open houses and career fairs. "The open house idea is good because it brings the people to us," says Charlie Pfaeffle, manager of Employment. "They get a first hand look at Grumman and we get to talk to them on our own turf."

In 1985, Grumman held over 20 open houses at its facilities around the country. At the open houses, potential engineering recruits get a chance to ask questions about the company as well as provide answers about themselves.

Pfaeffle says an average open house might attract as many as 100-120 engineers. "Some of them are just shopping the market and some don't have what we're looking for," he says. "But generally, we find 10 to 15 percent of those we interview merit a call back. Even if only a few are eventually offered positions with Grumman and accept, it's still less expensive and faster than using employment agencies."

Grumman also makes recruiting trips to areas with specific skill pools. "When we have a specific skill need, we send recruiters to an area in the country where we know that need can be filled," says Pfaeffle.

"For instance, we might be looking for structural designers – so we send our people to a hotel in, say California, and advertise in the local media that we're in the area actively recruiting structural designers. We hold interviews and make offers to the people we like and think we can get. It's a very direct method of filling a specific need." Last year Grumman recruiters ventured out on 14 such sorties.

Career fairs are another avenue that Grumman recruiters have been traveling more often these days. The fairs are held across the country, usually by independent companies who act as "employment caterers." They sign up anywhere from 20 to 50 companies in related fields that are looking for new people, hire a hall and advertise in the local media to draw job hunters. The companies rent booths at the fair and make their pitch.

In 1985 Grumman recruiters attended more than 35 career fairs around the U.S. The idea of a career fair is to see as many people as possible and select those who would be of interest to Grumman for later in-depth interviews.

Career fair recruiting is very intense. Recruiters compete with representatives of the other companies at the fair. "And in this market that can get pretty wild," says Pfaeffle. Companies have even been known to send their recruiters to visit other company's booths posing as potential employees to find out what the competition is offering.

The fairs also make for long days. Recruiters generally spend from 10 o'clock in the morning until eight o'clock at night at the company's booth, often talking to over 200 people during an average two-day show.

Still, the most popular method for Grumman recruiters is the open house. At a recent open house held in Grumman's Bethpage headquarters building, recruiters were looking for engineers to work for Grumman's newest division – Melbourne Systems, located in Melbourne, Florida.

One engineer who showed up said he remembered not too long ago "when engineers were a dime a dozen. These days we're in the driver's seat and the choices are getting a lot better."

Dan Nettuno, personnel manager for Melbourne Systems, says selling a job in sunny Florida to Long Island engineers in the middle of winter is a lot easier than most recruiting assignments he's been involved with. "But finding the *right* people and enough of them is still very difficult."

Melbourne Systems needs engineers to work on the $647-million Joint STARS (Joint Surveillance Target Attack Radar System) contract won by Grumman in September 1985.

The division will eventually employ approximately 600 people who will train and work in Melville, Long Island until the new building is completed in Florida at the end of 1986.

"I spotted the advertisement in a newspaper while standing in the freezing cold waiting for a bus," said a 50-year-old engineer who had traveled all the way from Philadelphia.

The interviewee, who currently works for RCA in Camden, New Jersey, had considered moving to Long Island to work for Grumman for some time. "My daughter lives on Long Island. With this job though, I get to spend a year or two on the Island with my daughter, and then head down to Florida.

"That's where I have sort of an ace-in-the-hole – I bought a vacation home in Melbourne several years ago. So you see the job is perfect fit for me – I just hope I'm a perfect fit for Grumman."

New High-Tech Jobs Of The '80s

Just a generation ago, few of us gave much thought to owning a computer when we grew up — much less a personal computer that takes up less room than a TV set.

Similarly, our childhood aspirations were conventional: fireman, teacher, policeman, doctor.

Today, technology has radically altered people's career goals. The Federal Bureau of Labor Statistics expects high-tech to create 1.7 million new jobs by 1995.

Computer programmers and engineers are in stronger demand than ever, but new sub-specialties are also sprouting up that were virtually nonexistent a decade ago. An example: fiber optics technicians, who use glass tubes in place of wire, are a sub-specialty of electronic technicians.

The changes have altered the makeup of the Grumman work force, too.

"Jobs are never static," Frank Maslak, Grumman's manager of Wage and Salary Administration, points out. "As the result, we are always revising job descriptions."

Made By Memory. *Analyst John Burkhart sets up a pattern for digitizing an aircraft part on the MTX system. Plant modernization has created jobs for people who create computer programs that control new shop machinery.*

One area at Grumman where change has been felt is on the shop floor. Grumman's multimillion-dollar modernization program aims to increase productivity and thus, the company's competitive posture. It has also created a variety of new jobs.

As new machines appear on the shop floor, not only must operators learn new skills — but there are new behind-the-scenes jobs to ensure the equipment works to its maximum potential.

In many cases, production people are filling these slots. Their new jobs tend to be less arduous than their old ones, while more challenging.

"In addition to working with your hands, you're working with your noodle," says robotics technician Warren Brown.

In the last five years, Brown has become something of an expert on his tin-man friend "Robyn" — a robot in Bethpage's Building 3 that drills and routs aircraft panels. Robyn is nicknamed after Brown's six-year-old daughter.

Robotics is now in its infancy in American industry. Today, it employs a scant 6,000 engineers, technicians, salespeople and other specialists. A University of Michigan study predicts that number will jump to 44,500 people 10 years from now.

Throughout most of his life, Brown never envisioned having anything to do with robots. He first worked at Grumman eight years after high school as a shipping clerk. He quit to start his own home improvement business in 1969, but rejoined Grumman in 1979 when the Long Island economy — and the market for dormers and extensions — went into a slump.

Brown worked on F-14 wing assemblies, then in routing. "I was bored," he recalls. "I spoke to the plant manager — I told him, 'I'm an older guy with a family. I want something that's more of a challenge.' Two months later he offered me the job of robotics technician."

Teaching the robot to handle its shop tasks was indeed challenging. Brown worked closely with advanced development engineers and other technicians. "I studied at home — I had to put a lot of extra time into it," he recalls.

Brown is a member of the Robotics International Society, and is a regular at the Long Island chapter's monthly seminars. He has also traveled to several conventions in the Midwest. The industry journal *Robotics Today* arrives every month in the Brown family's mailbox.

"Right now, robotics is a small field, but it's definitely the next wave," he says. "Robots don't replace people — instead, the field offers a lot of opportunities. I feel I'm getting an education, as opposed to just doing a job."

John Burkhart is another Grummanite in a new occupation. A decade ago, Burkhart went to work in Bethpage's Building 2 as a subassembly riveter. Today, he is a nesting and digitizing analyst — one of six people who create computer programs that instruct complex machinery to cut aircraft parts.

At Grumman, thousands of aircraft parts must be digitized — entered into computer memory. Nesting is the ability of the computer program to group parts of like thickness on a single pattern or template, thus reducing scrap.

"I was always looking to move into high-tech," says Burkhart, who started at Grumman fresh out of high school. "I worked in the template shop right before this, and they offered me this job because of my tooling background."

A system called MTX digitizes aluminum parts, which are cut on the two Trumpf routers in Building 3. MTX looks like a drawing table, and was designed originally for patternmakers in New York's garment district.

Burkhart is close to completing his associate's degree in mechanical engineering at SUNY-Farmingdale, and plans to continue for his bachelor's. "But I don't think I'd like 'straight' engineering," he says. I'd really like to stay in manufacturing engineering. It's more of a hands-on job."

New technology is also having an impact on the office. Computer systems have moved out of the back room and onto the desks of secretaries, executives, administrators, and a variety of other office workers. That has created a demand for office automation specialists.

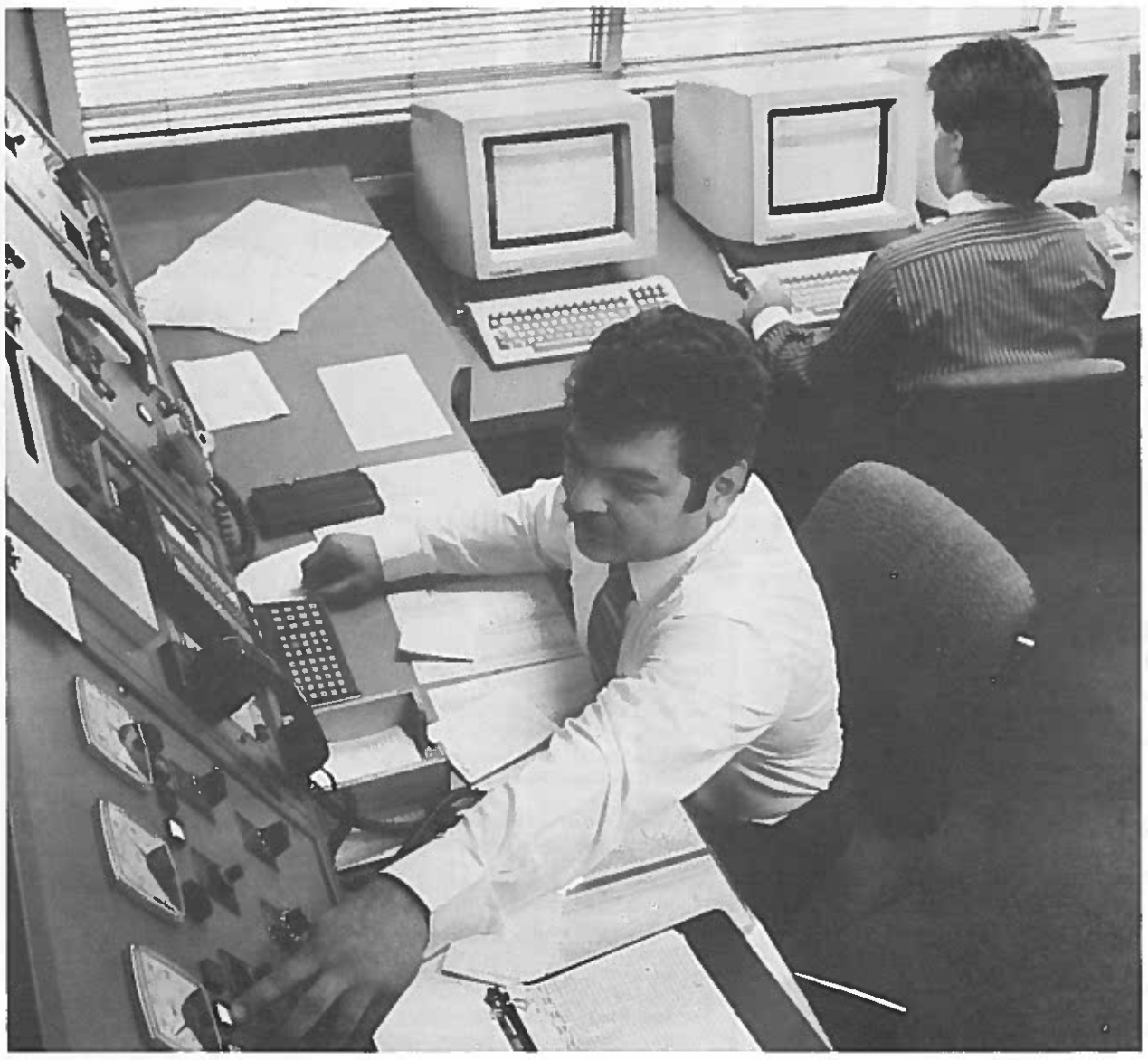
Caren Sanders is analyst — Human Resources/Office Automation — at Milledgeville Operations in Georgia. She took the assignment two years ago, bringing to it a diverse background that includes stints as a secretary, a manpower planner, and administrator of the employee contribution council within the public affairs department.

Sanders oversees all microcomputer and office automation equipment at Milledgeville. This runs the gamut from personal computers and peripheral equipment to word processors and conventional typewriters. She sees to it that Grummanites have the right hardware and software, participates in the setup of new equipment, trains new users, and upgrades current users. Since equipment is shared among more than 150 people, careful planning is essential.

Sanders took several computer courses, but most of her computer knowledge is self-taught. "You learn by doing — especially after inadvertently erasing a few hard disk drives," she says. "When I moved to Milledgeville, the greatest use of computers was in Finance, so I had to learn to operate them."

Since hers is a service organization, the job requires a high degree of interaction with the users.

Shape Of Things To Come. *(Opposite page) Seeking a more challenging job, Warren Brown joined the nascent robotics field. He oversees Robyn, an industrial robot that drills and routs aircraft panels. (Above) Diane Spicola conducts a course on Wang Laboratories' word processing systems at Grumman Headquarters. With computers pervading all areas of the workplace, people who teach others to operate them are in high demand.*



In Rain Or Snow. *John Ingenito is co-supervisor of the Facilities Operation Center, a sophisticated computer installation that monitors Grumman facilities around-the-clock. In background is coordinator Bob Madarasz.*

"So patience, tact, persistence, and friendliness are important qualities that take as much time to develop as learning to operate the equipment," says Sanders. "The payoff is seeing another person achieve. I really enjoy that aspect of my job. People have really taken off with office automation here. That's rewarding.

"In addition, I came to Grumman as a secretary, so I understand what is required to perform a clerical function, and the anxiety secretaries and clerical people go through when new, unfamiliar equipment shows up on their desk," adds Sanders, who owns a home computer and often makes service calls to help her neighbors with a computer problem.

Another new job was created when Grumman's Facilities Operations Center opened its doors in 1982: the facilities coordinator. Four coordinators and two supervisors staff the Facilities Operations Center, 24 hours a day, 365 days a year. And to keep pace with the steadily increasing numbers of Grumman buildings, the number of coordinators will be doubled in the next few years.

The Center, which is adjacent to Bethpage's Building 2, is one of the most advanced in industry. There, a sophisticated array of computers keeps watch over heating/ventilation/air conditioning systems, factory machinery, lighting, microwave stations, electrical transformers, and other equipment at most of Grumman's Long Island buildings.

Coordinators monitor the computers and dispatch crews to crises such as electrical outages, fires, snow detail, and chemical spills. A computer systems analyst, four drivers, and two electricians are also on hand at the Center.

"It's often hard finding coordinators with the right mix of skills," says supervisor John Ingenito. "Knowledge of computers is a plus. It's good to have some electrical or mechanical background. And it helps to know the structure of the company. The most important quality is common sense – the ability to make quick decisions."

One day last summer, due to rising temperatures and soaring power consumption, Long Island Lighting Company asked its largest business customers to voluntarily reduce their usage. The facilities coordinators had a predetermined plan to notify 75 key people thoughout the company upon notification by LILCO. Via automatic dialers and recorded messages, the proper people were notified 10 minutes after LILCO's call.

Also in demand are the people who train employees to operate computer equipment.

According to a recent study, U.S. companies now spend $210 billion each year training employees – about two-thirds of which is done in-house by the employer. At Grumman, the Career Education and Training department began giving office automation classes three years ago; before that, people often had to learn the equipment on their own.

Instructor Diane Spicola joined Grumman just over a year ago, after working three years at Word-Pro, a vendor of office equipment. She chose a career in industry over secondary school teaching because "you're teaching adults. They genuinely like what they're doing," says Spicola. "That isn't often the case with high school kids."

In the training field, a technical background is a prerequisite, but just as important is the ability to teach and communicate. Each of Grumman's four instructors teaches class three days a week. The balance of their time is spent learning new systems.

"You always have to re-educate yourself, because computers are constantly becoming more sophisticated," says Spicola. "For instance, PCs have only been around in business for about five years now. Database functions, which used to be done on a mainframe, can now be done on a PC."

Classes usually consist of 15 to 20 people grouped according to ability and background. On Long Island, they are held in Grumman headquarters, but the instructors conduct classes off Long Island, too.

"More companies are realizing just how effective in-house training can be," she says. "The schools out there that specialize in office automation are very expensive. And when we give a course, we try to design it specifically for the group being trained, based on what their needs are. It's more effective that way."

At Grumman, new jobs owe as much to new business ventures – especially in electronics – as to new technology. The new Tachonics Corporation, an affiliate of Grumman's Electronics Systems Division, offers a case in point.

Tachonics was established last summer to design and manufacture integrated circuits with the chemical compound gallium arsenide.

Integrated circuit design isn't new to Grumman (Great River has produced silicon circuits), but the material is – and so are some of the technical people that will do the job. Among the new sought-after specialists are ion implantation technicians, who alter the gallium arsenide wafer to improve the performance of the integrated circuit.

Finally, some fields have foiled "experts" who were too quick to predict their demise. One of those is drafting.

In the last few years, the traditional drafting table and T-square have been replaced by sophisticated computer assisted design and drafting (CADD) systems. Rather than phasing out jobs, there's a strong demand for drafters who know CADD systems.

Grumman Data Systems Institute began a course this fall to train CADD drafters. "When they graduate, I feel sure they'll be hired immediately," says Harry Krane, manager of training and development at the Institute. "There are some companies out there that hesitate to buy equipment because it's hard to get experienced operators. So we feel the employment opportunities are wide open."

Echoes Len Deibler, group head of Drafting Technology in Aircraft Systems' Design Support department: "The draftsperson has the ability to visualize things. That's a skill we don't want to lose."

In Design Support, 260 draftspeople turn out the final drawings of aircraft and ground support equipment parts. Virtually all of those are now produced on computer terminals, using the Computer Aided Design and Manufacturing (CADAM) system.

The computer method is faster than pencil and paper and enables the creation of a database that may be used by other disciplines. One of these is manufacturing, which can tap right into this database for programming computerized shop equipment.

Even more important, it's more accurate. "The structures we produce at Grumman are more exacting compared to airplanes we produced in the past," says Deibler. "In addition, the materials we use have changed. All of that impacts on the drafter."

The drafters attend a Grumman Engineering and Manufacturing System (GEMS) course to learn the new system. The experience has been overwhelmingly positive. Says Deibler, "Once someone is trained on CADAM, they never want to go 'back to the drawing board'." ■

A. H. Hoffmann

W. F. Nelson

R. P. Schroeder

E. S. Matthews Jr.

W. R. Weaver

G. Levine

R. H. Franke

A. Pecora

R. G. Decker

R. K. Bies

R. M. Benning

D. C. Voigt

C. S. Osborne

J. Campisi

R. Sperling

Service Milestones

40

Nicholas Genega, Electro/Mech. Des., Bethpage, Aircraft

35

John L. Giordano, Mat'l. Short. Cont., Bethpage, Aircraft
George W. Hervey, Conv. Mach., Bethpage, Aircraft
Richard H. Imgram, Avion. Des. Mgmt., Bethpage, Aircraft
Robert W. Kress, Eng. Test Ops. Mgmt., Bethpage, Services
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Let Us Know

We don't want to do all the talking.

Letters to the editor should be addressed to *Grumman World*, 1111 Stewart Avenue, A22-GHQ, Bethpage, N.Y. 11714, and should include your name and address. Letters may be edited for clarity or space.

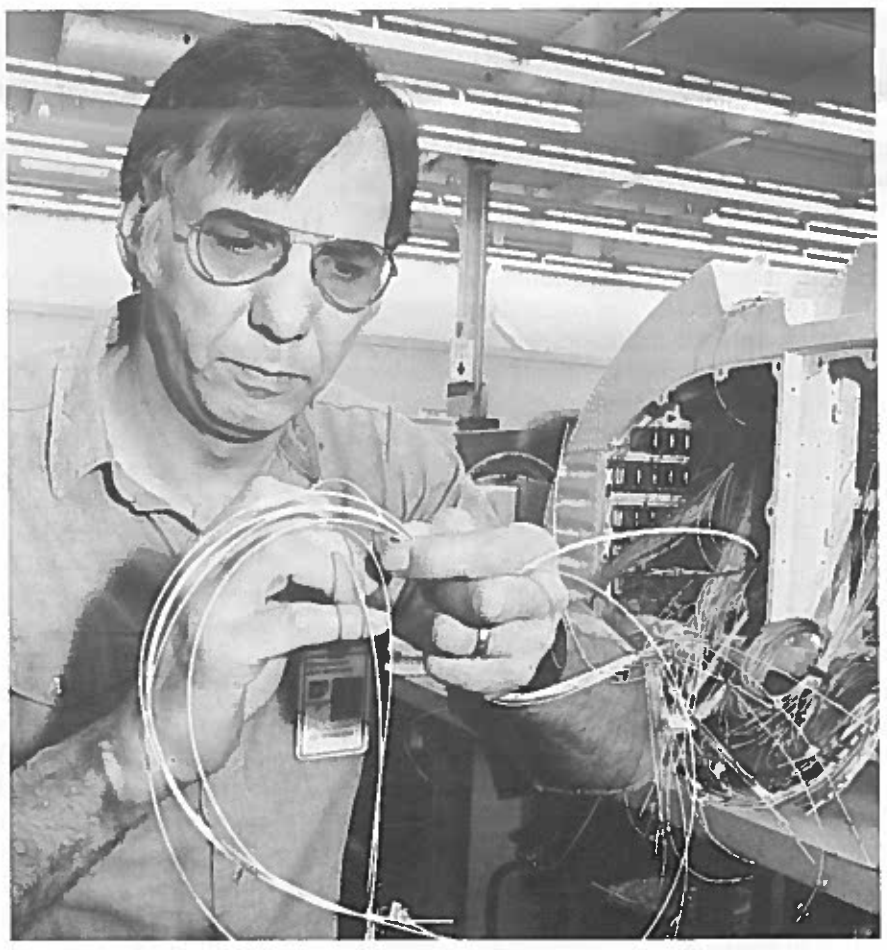
Data Systems Names Directors

In Grumman Data Systems' Information Systems group, Vice President Al Picarelli has been named director of Program Management. He reports directly to Senior Vice President Gerry Sandler.

In addition, Paul Baker and Bill Eager have been appointed deputy directors of Program Management, and Dennis Pelehach has been named director, Commercial New York State Programs for Program Management.

Stu Steele has been appointed director of Engineering, while Gene Lowe and Mario Panzarella have become deputy directors.

The Information Systems group has also set up a number of regional business development offices. Bruce Levy, sr. vice president of Grumman-CTEC, and Baker were appointed directors of the Washington, D.C., region. Joe Stump, Information Systems Vice President Howard Broderson, and Dr. Robert White were named directors of the Northeastern, Southern and Western regions, respectively. ■



A Web of Wires

"It looks a little confusing," says senior electrical assembler Bob Workheiser, "but you get the hang of it after a while."

He works at Electronics Systems' Great River Operations on Long Island. Workheiser is installing an E-2C junction box. "About 2,000 different wires go in and out of this box," he says.

Workheiser tags each wire with an identification number. These numbers are then checked against a terminator list that tells installers where each wire should go. He and his partner, electrical assembler Jerry Lynch, spend approximately three weeks on a junction box — wiring, checking and making inventory of each wire and connector.

"You have to be careful not to let yourself get confused," says Workheiser. "It takes patience and plenty of time to read and check out all those tiny numbers." (Photo by Bob Settles)

People

A Long, Lost Friend

As a young infantryman in the French Alps in 1944, Grummanite Paul Conde got a bad case of frostbite. Forty years later, Conde finally got the opportunity to thank the man who helped save his legs – a man whose name Conde didn't know.

That winter of '44, Conde had been in action with the 65th Infantry Regiment against the Nazis in the French and Italian Alps. He was sent to a hospital in St. Raphael, France, on December 21, 1944, to have his frostbitten feet taken care of.

A spinal injection he was given temporarily paralyzed him below the waist. "I was in a lot of pain, and I was having difficulty communicating with the nurses and the doctors," recalls Conde, who was born in Puerto Rico.

In the bed next to Conde was La Polla – "the chicken", a Texan of Mexican heritage. La Polla not only translated for Conde, he also helped Conde exercise his legs. Conde lost several toes to the frostbite, but La Polla's kindness helped save Conde's legs.

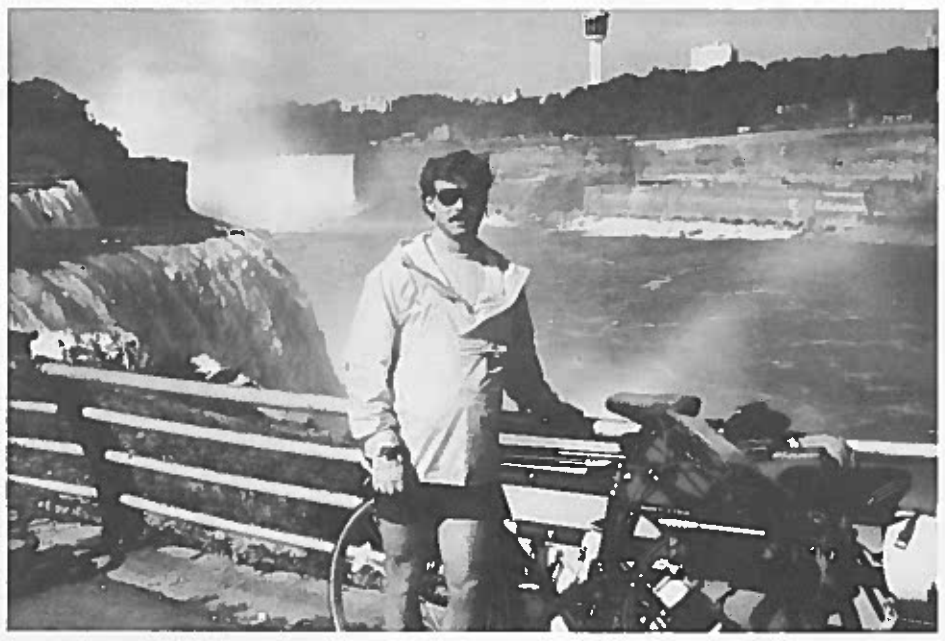
Unfortunately, Conde never learned La Polla's real name. La Polla left the hospital and went back into combat. Conde spent 358 days in hospitals, then was discharged.

Forty years later their worlds touched once more. In November 1984, Conde and his wife visited family in Houston and decided to drive to Mexico. Conde took a shot in the dark and tried to find his friend. He knew La Polla lived in Sinton, Texas, a town just north of Corpus Christi.

He stopped at a gas station in Sinton and asked if anyone had ever heard of a man nicknamed La Polla. A fellow waiting at the station said he grew up with La Polla and took Conde to see the man who helped save his legs years ago. "I finally found out my friend's real name was Florentino Segovia," says Conde, who works in Chem Milling in Bethpage.

Today, Conde is the commander of the Grumman Disabled American Veterans Association. After fellow vets heard Conde's tale, they decided to fly La Polla to Long Island to speak at their 1985 annual dinner. At the November dinner, Conde finally presented his long lost friend with a certificate of appreciation for his act of kindness 40 years ago.

Long-time Coming. *It took a little luck and 40 years to make this photo possible. Grumman Disabled Vets president Paul Conde (C) celebrates with his long lost friend Florentino Segovia (R). The Grumman club members flew Segovia to New York for a happy reunion. With them are Paul's wife Rose, and grandchildren, Melissa and Michael. (Photo by Jim Wagner)*



Miles Of Memories. *Grumman engineer Jeff Banger, shown at Niagara Falls, hit the road before he hit the drawing boards of the F-14 program. After graduating from the State University at Stony Brook, he and two friends bicycled across the U.S.A. from Long Island to California.*

Pedalling Across U.S.A

"We became connoisseurs of pancakes."

Where to get good flapjacks was just one of many things Grummanite Jeff Banger learned on his 4,452-mile bicycle trek across America last summer.

As graduation from the State University of New York at Stony Brook approached, Banger and two buddies decided to tackle one last summer fling. Before their departure, they sent out resumes and went on job interviews. On Memorial Day morning, the three set out on their journey.

"The first night was a real bummer. It was raining. We didn't know what we were going to do for dinner," Banger recalls. They found a house under construction and heated some canned spaghetti. However, along their route, they met plenty of people who gave them shelter and help.

"We were in Ithaca no more than five minutes when somebody offered us a place to stay," says Banger. "In Canandaigua, N.Y., a store owner took 50 percent off the price of everything for us. In Minnesota, there was a town celebrating its bicentennial. The townspeople told us to help ourselves to food."

As with most new grads, money was a problem. To cut costs, they camped in rest areas on the road, in graveyards and near reservoirs. They avoided overpriced campgrounds. Instead, they'd find college campuses and pitch their tents in isolated corners, then shower in the locker rooms before anyone was around.

When they called home during the trip, they heard good news. In Canada, Banger learned that he had a job as an assistant structural designer at Grumman. In Minneapolis-St. Paul, his buddy left for a choice assignment with the Peace Corps. Later, Banger's remaining companion got good news about a teaching job.

Banger appreciated the beauty of the country at the slow pace of his two-wheeled perch. "Once we saw mulehorn deer. We were just sitting there, watching them," he says. "Cars would drive right past and miss it all."

What started with a spaghetti supper in the rain on Memorial Day ended with a bath in the Pacific 71 days later. "We walked into the water with our bikes, then we sat on the beach and watched the sun go down."

A Few Good Men. *Mickey Hutter (R), director of Marine Programs at Grumman's Washington, D.C., office, recently received the Fighting Hawk Award from retired Maj. Gen. Paul Fontana. Hutter was honored for his leadership in the Marine Corps Aviation Association. He has also been re-elected national commander of the association for 1986.*

Retiree Obituaries

Achille Baldassarri of 30 Bay Beach Ave., Bayville, N.Y., died Dec. 31,1985. He retired in 1980.

Dorothy Barber at P.O. Box 179, Speonk, N.Y., died Jan. 5, 1986. She retired in 1981.

Philip C. Bettinger of RD 4, Box 194D, Willsboro, Delaware, died Jan. 1,1986. He retired in 1970.

Robert E. Boegel of 1607 Lad Ave., Medford, N.Y., died Dec. 20, 1985. He retired in 1984.

Ratje Bunke of 259 Howell Ave., Riverhead, N.Y., died Nov. 25, 1985. He retired in 1968.

Wilfrid E. Burelle of 235 Tigertail Ct., Indiantown, Florida, died Dec. 26,1985. He retired in 1983.

Joseph A. Cordani of 24 Downing Dr., Daytona Bch., Florida, died Dec. 10, 1985. He retired in 1974.

Ruben Custis of 11 Denton Place, Roosevelt, N.Y., died Jan. 3,1986. He retired in 1974.

Leo Fischer of 2600 SE Ocean Blvd., Stuart, Florida, died Dec. 8,1985. He retired in 1983.

Jack Goulla of Sally La. Ridge, N.Y., died Dec. 20,1985. He retired in 1964.

Francis Hanratty of 2 Forest Row, Great Neck, N.Y., died Nov. 5, 1985. He retired in 1967.

Samuel Harper of 1821 McDowell Rd., Norfolk, Virginia, died Dec. 16,1985. He retired in 1970.

J. Arthur Hellsen of Falls Rd., Box 139, Roxbury, Connecticut, died Dec. 17,1985. He retired in 1969.

Arthur N. Higdon of 2008 Live Oak La., Apopka, Florida, died Nov. 25, 1985. He retired in 1978.

John J. Keenan of 1 Reading La., Bethpage, N.Y., died Dec. 25,1985. He retired in 1976.

Franklin J. Kelly of 2814 Cavendish Ct., New Port Richey, Florida, died Nov. 24, 1985. He retired in 1975.

George Litsch of 205 Lynn Ave., East Northport, N.Y., died Dec. 6, 1985. He retired in 1971.

Thomas Maher of 201 W. Montgomery Crossroads, Savannah, Georgia, died Dec. 24,1985. He retired in 1977.

Lucy A. Matthews at P.O. Box 798, Stony Brook, N.Y., died Jan 5,1986. She retired in 1984.

Mary E. Newman of 9 Collins Ave., Merrimack, New Hampshire, died Dec. 18, 1985. She retired in 1981.

John M. O'Donnell of 578 Hawthorne St., Massapequa, N.Y., died Dec. 6, 1985. He retired in 1972.

Peter Peyrat of 32 Murray Pl., Merrick, N.Y., died Nov. 30, 1985. He retired in 1973.

John Podkanowicz of 3 Chestnut St., Greenvale, N.Y., died Dec. 3, 1985. He retired in 1976.

Willard C. Ports of 16 Peary La., Kings Park, N.Y., died Dec. 11, 1985. He retired in 1976.

Frederick E. Randall of 555 N. Newbridge Rd., Levittown, N.Y., died Nov. 27,1985. He retired in 1969.

Fred H. Rosener of 3308 Merion Ct., Virginia Bch., Virginia, died Oct. 15, 1985. He retired in 1961.

August W. Schmidt of 6760 NW 24 Pl., Sunrise, Florida, died Nov. 20, 1985. He retired in 1965.

John G. Shokey of 347 36th Ave., St. Petersburg, Florida, died Dec. 9, 1985. He retired in 1970.

Adolph J. Sirinek of 154 Claywood Dr., Brentwood, N.Y., died Jan. 1,1986. He retired in 1977.

Alfred J. Stern of 405 W. Main St., Huntington, N.Y., died Nov. 27, 1985. He retired in 1973.

William H. Thomas of 186-15 Brinkerhof Ave., St. Albans, N.Y., died Dec. 14, 1985. He retired in 1984.

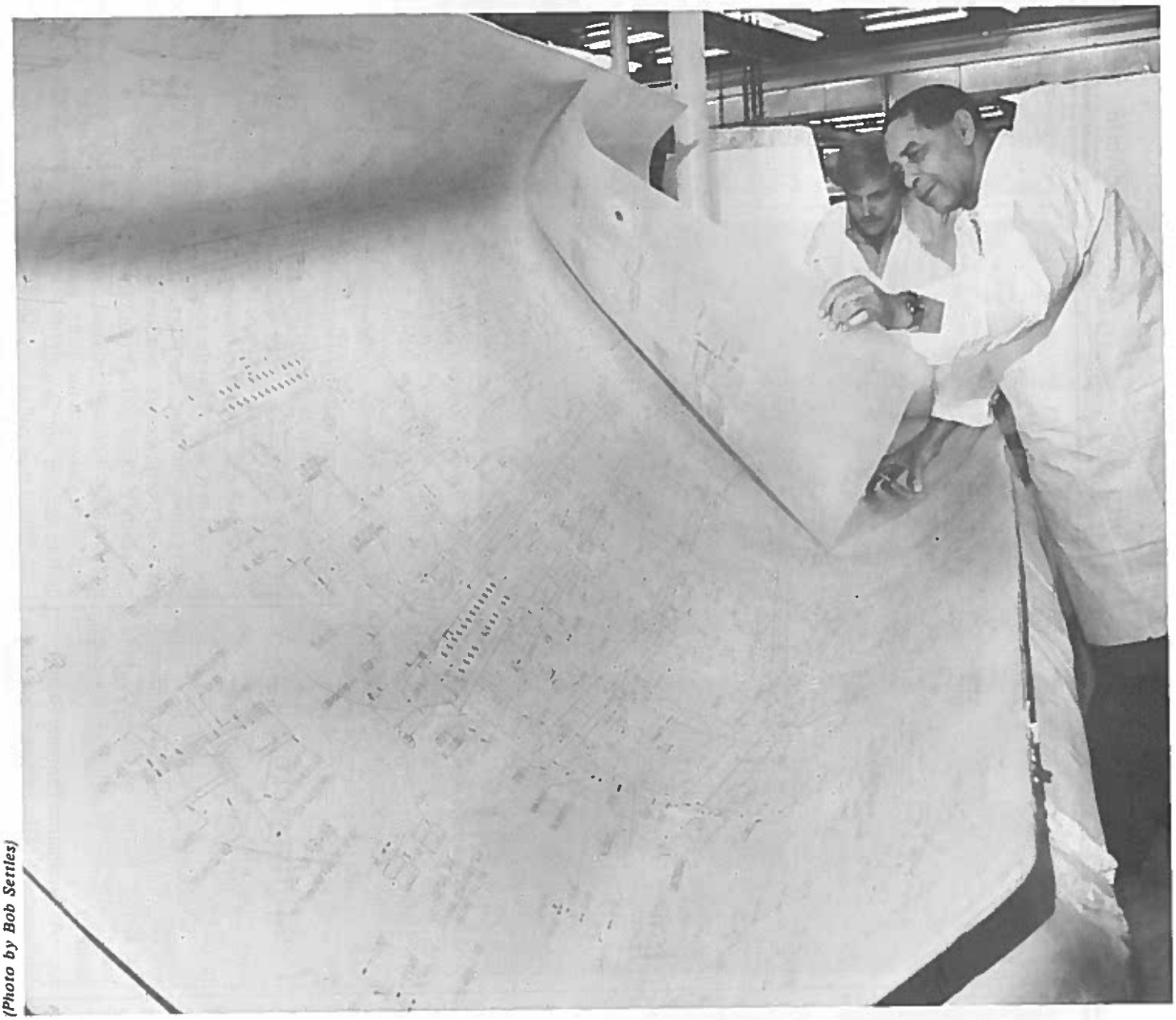
Clarence S. Wetmore of Canton Prof. Center, Canton, N.Y., died Nov. 13, 1985. He retired in 1962.

Robert L. Wilkens of 4856B Sunset Terrace, Fair Oaks, California, died Dec. 22,1985. He retired in 1977.

Chester Zembko of 4 Cross St., Locust Valley, N.Y., died Dec. 13, 1985. He retired in 1977.

Emil J. Ziomek of 2310 Edward Rd., Lake Park, Florida, died Nov. 28,1985. He retired in 1978.

GrummanWorld
January 31, 1986



(Photo by Bob Settles)

The Writings Of A Master

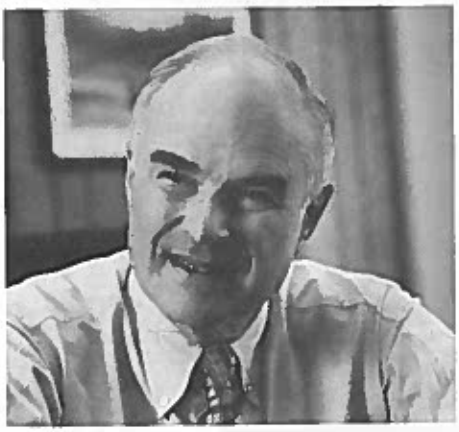
Those aren't hieroglyphics painted on the inner surface of this tub-like fiberglass master – one step in the production of a fuselage skin section for the EA-6B Prowler.

The drawings are of the skin's outline and other data. Stennie Hall (R), an Aerostructures Division group leader in Building 11 in Bethpage, and Ralph Leutz of Methods Engineering are shown checking changes on the drawings.

In this age of computer-aided drafting equipment, Grumman draftsmen use a familiar instrument for this task: a pencil. Their artistry is then sprayed with a clear coating for protection.

Once the drawings are finished, the master is used to make stretch dies and tool dies required for manufacturing the metal skin.

A Letter From The Chairman



Like Lincoln's birthday, Columbus Day, Veterans' Day and others, the birthday of Dr. Martin Luther King, Jr., was not a holiday at Grumman. Adding a holiday adds enormous cost to any company's benefits plan. Right now, at a time when we are doing our best to control our overhead expenses, we can't afford the extra holiday – and an alternative solution is not yet in sight. However, we should not let the first formal national observance of Dr. King's birthday go by without thinking about what he meant to the nation – and especially to the workplace.

Dr. King, perhaps more than any other American, shoved our country toward the goal of equality. He made us look long and hard at our country – at schools, at housing, at employment – and recognize and admit that discrimination against black people was against everything our nation stood for. If people turned their faces away to pretend it wasn't all that bad, he insisted that they look again – demanding, "Which side are you on?" He believed in the essential goodness of the American people and expected them to do the right thing.

In the January 27 issue of *Newsweek* magazine, Nobel laureate Bishop Desmond Tutu of South Africa talks about this goodness, saying that he believed Dr. King's doctrine of nonviolence depended on the sort of people "... who would be appalled and outraged when they saw what police bullwhips could do to those protesting peacefully. It was to such a constituency that Dr. King could appeal."

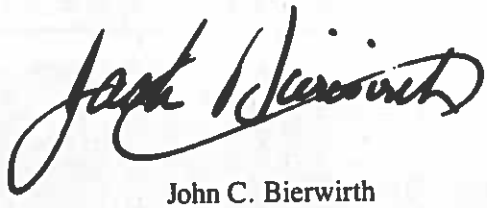
Dr. King's appeal to the nation's conscience resulted in legislation that would safeguard the civil rights of *all* people. At Grumman, the Equal Employment Opportunity Department was established in the late '60s – and the good work started then continues today. Between 1980 and 1985, our company population grew by approximately 4,000. About 800 of those people – 20 percent – are members of minority groups. Thirty-five percent of the 4,000 new hires are women.

Grumman has received many commendations for its accomplishments in providing equal opportunity – but that doesn't mean we can't improve on what has been done so far.

Our government is currently discussing a proposal that would weaken Executive Order 11246. This order was put in place in 1965. It requires companies to set goals and timetables for hiring and promoting minorities and women. Under the new proposal, compliance would be voluntary.

But no matter what the outcome of the discussion, Grumman will continue to keep its goals and timetables in place. Equal opportunity in the workplace is the right policy for all Americans. It is the right policy for us, and Grumman will be stronger for following it. I am convinced that we can prove by our performance that voluntary compliance can be made to work.

Dr. Martin Luther King Jr. was a great American; one whom all of us can admire as a leader and as a human being. Let's make sure we help his dream come true.



John C. Bierwirth
Chairman

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